## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization International Bureau





(43) International Publication Date 8 July 2004 (08.07.2004)

**PCT** 

(10) International Publication Number WO 2004/056465 A1

(51) International Patent Classification7:

B01J 8/18

(21) International Application Number:

PCT/EP2003/013982

(22) International Filing Date:

10 December 2003 (10.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

102 60 741.9 23 December 2002

23 December 2002 (23.12.2002) DE

- (71) Applicant (for all designated States except US): OUT-OKUMPU, Oyj [FI/FI]; Riihitontuntie 7, FIN-02200 Espoo (FI).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): NUBER, Dirk [DE/DE]; Haingrabenstrasse 26, 60488 Frankfurt am Main (DE). STOCKHAUSEN, Werner [DE/DE]; An der Bleiche 4, 61118 Bad Vilbel (DE). STRÖDER, Michael [DE/DE]; Dürerstrasse 77, 61267 Neu-Anspach (DE).

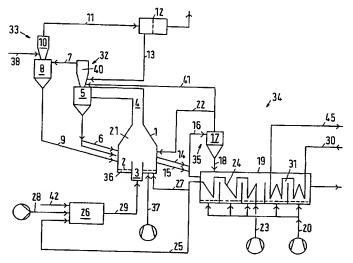
- (74) Agent: KEIL & SCHAAFHAUSEN; Cronstettenstrasse 66, 60322 Frankfurt am Main (DE).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

## (54) Title: METHOD AND APPARATUS FOR HEAT TREATMENT IN A FLUIDIZED BED



(57) Abstract: The present invention relates to a method for the heat treatment of fine-grained solids, in particular gypsum, in which the solids are heated to a temperature of 50 to 1000 °C in a fluidized bed reactor (1), and to a corresponding plant. To improve the energy utilization, it is proposed to introduce a first gas or gas mixture from below through a preferably central gas supply tube (3) into a mixing chamber (21) of the reactor (1), the gas supply tube (3) being at least partly surrounded by a stationary annular fluidized bed (2) which is fluidized by supplying fluidizing gas, and to adjust the gas velocities of the first gas or gas mixture as well as of the fluidizing gas for the annular fluidized bed (2) such that the particle Froude numbers in the gas supply tube (3) are between 1 and 100, in the annular fluidized bed (2) between 0.02 and 2 and in the mixing chamber (21) between 0.3 and 30.

